Technology Program Management Model (TPMM) Overview

05-10-2006

Jeff Craver
Project Manager
Space and Missile
Defense Technical Center
Jeff.Craver@US.Army.Mil

Report Documentation Page

Form Approved
OMB No. 0704-0188

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED
10 MAY 2006		**00-00-2006 to 00-00-2006**

4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
Technology Program Management Model (TPMM) Overview	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER
	5e. TASK NUMBER
	5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) **Army Space and Missile Defense Technical Center,Huntsvile,AL,35807**	8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release; distribution unlimited

13. SUPPLEMENTARY NOTES
See also ADM002184. Presented at the Air Force Research Laboratory Seminar/Workshop on Multi-Dimensional Assessment of Technology Maturity in Fairborn, OH on 9-11 May 2006.

14. ABSTRACT

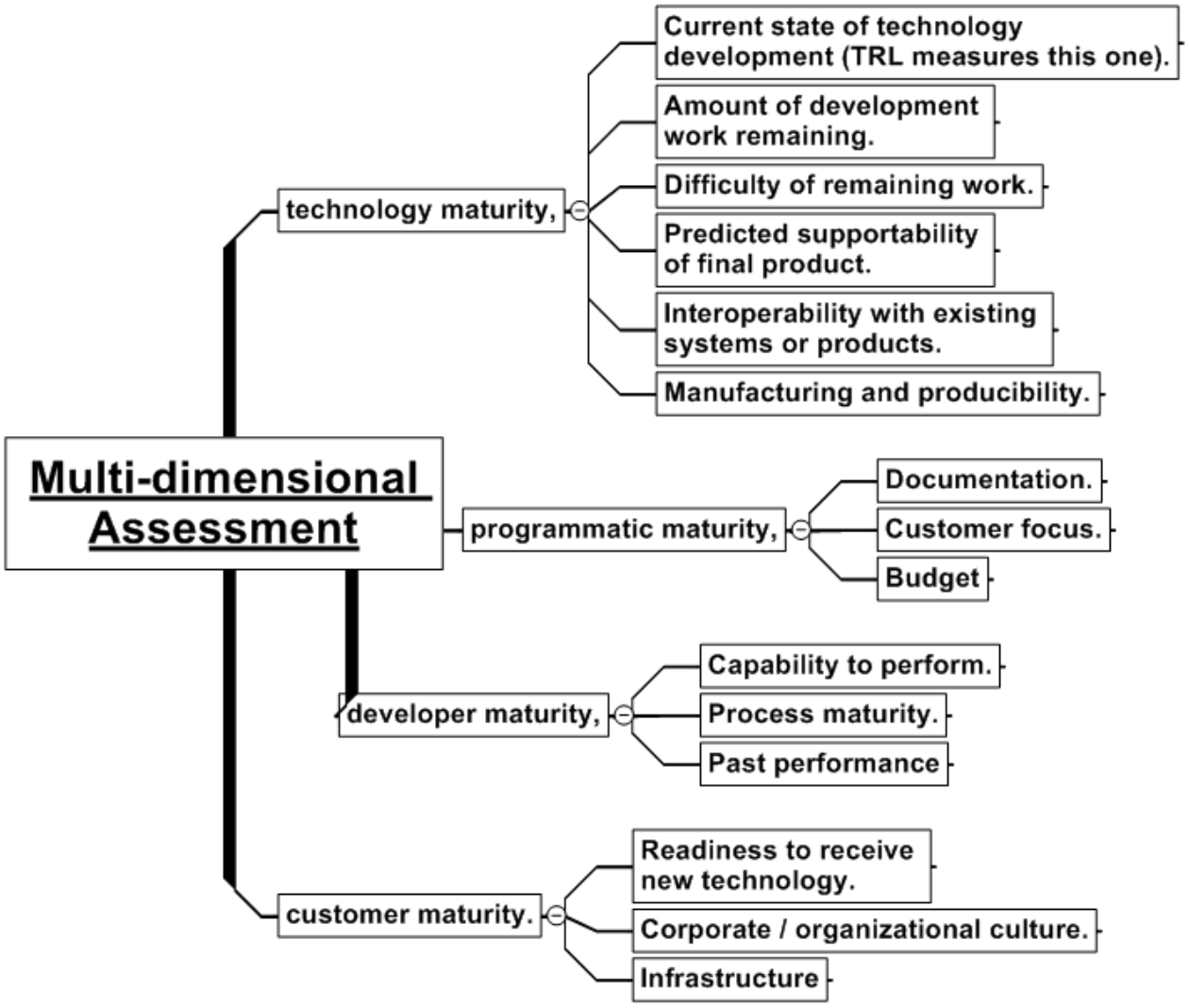
15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT **unclassified**	b. ABSTRACT **unclassified**	c. THIS PAGE **unclassified**	**Same as Report (SAR)**	**45**	

Space and Missile Defense, Technical Center

Mission is to “Successfully *support the transition* of evolving and mature technologies to customers.”

Technology Program Management Model (TPMM)


Multi-dimensional Assessment
technology maturity,
Current state of technology development (TRL measures this one).
Amount of development work remaining.
Difficulty of remaining work.
Predicted supportability of final product.
Interoperability with existing systems or products.
Manufacturing and producibility.
programmatic maturity,
Documentation.
Customer focus.
Budget
developer maturity,
Capability to perform.
Process maturity.
Past performance
customer maturity.
Readiness to receive new technology.
Corporate / organizational culture.
Infrastructure

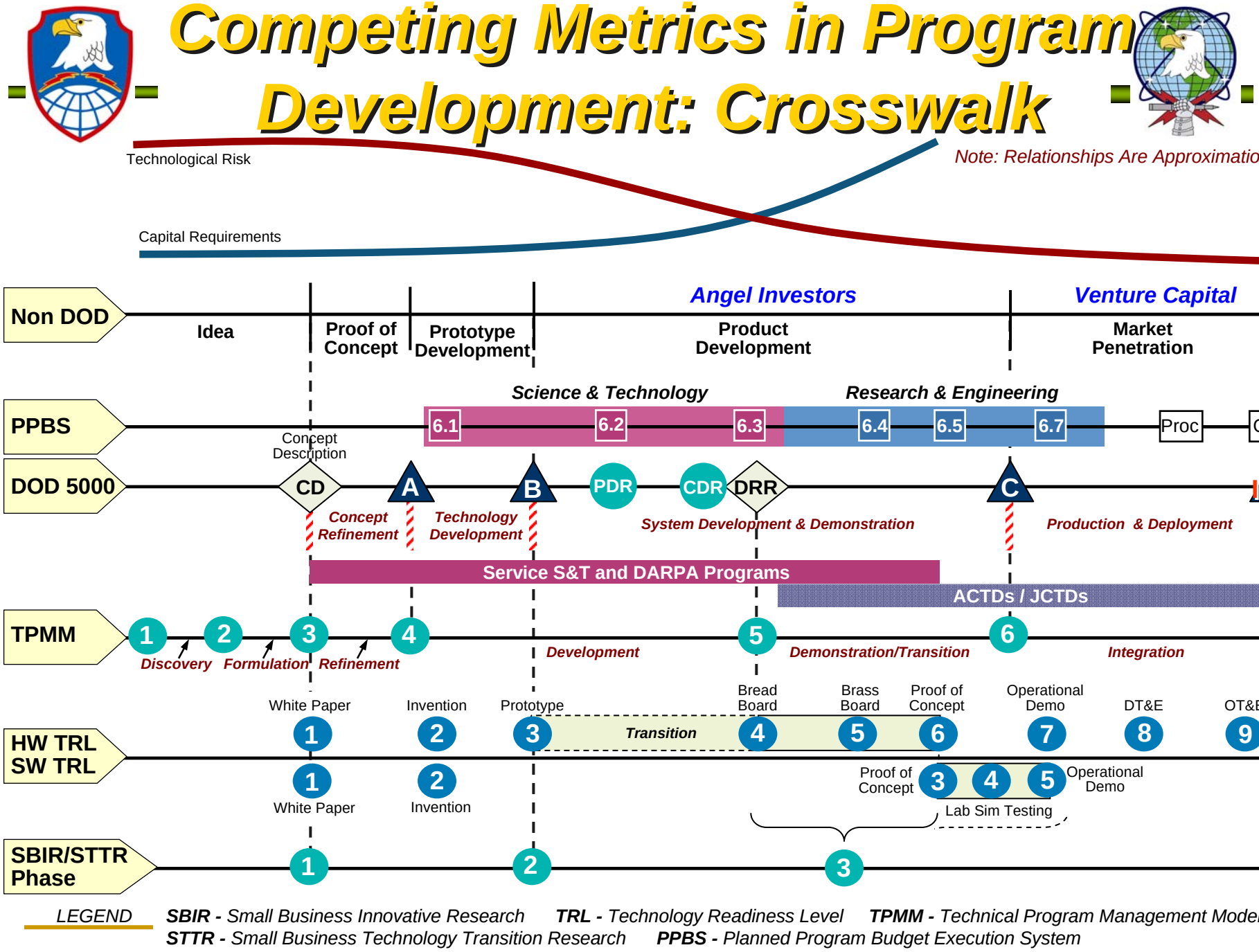
Quantifying the Effects of Immature Technologies

According to a GAO review of 54 DoD programs:

- **Only 15% of programs** began SDD [after MS B] with mature technology (TRL 7)
  - Programs that started with mature technologies averaged 9% cost growth and a 7 month schedule delay
  - **Programs that did not have mature technologies averaged 41% cost growth and a 13 month schedule delay**
- At critical design review, 42% of programs demonstrated design stability (90% drawings releasable)
  - **Design stability not achievable with immature technologies**
  - Programs with stable designs at CDR averaged 6% cost growth
  - **Programs without stable designs at CDR averaged 46% cost growth and a 29 month schedule delay**

Source: Defense Acquisitions: Assessments of Selected Major Weapon Programs, GAO-05-301, March 2005

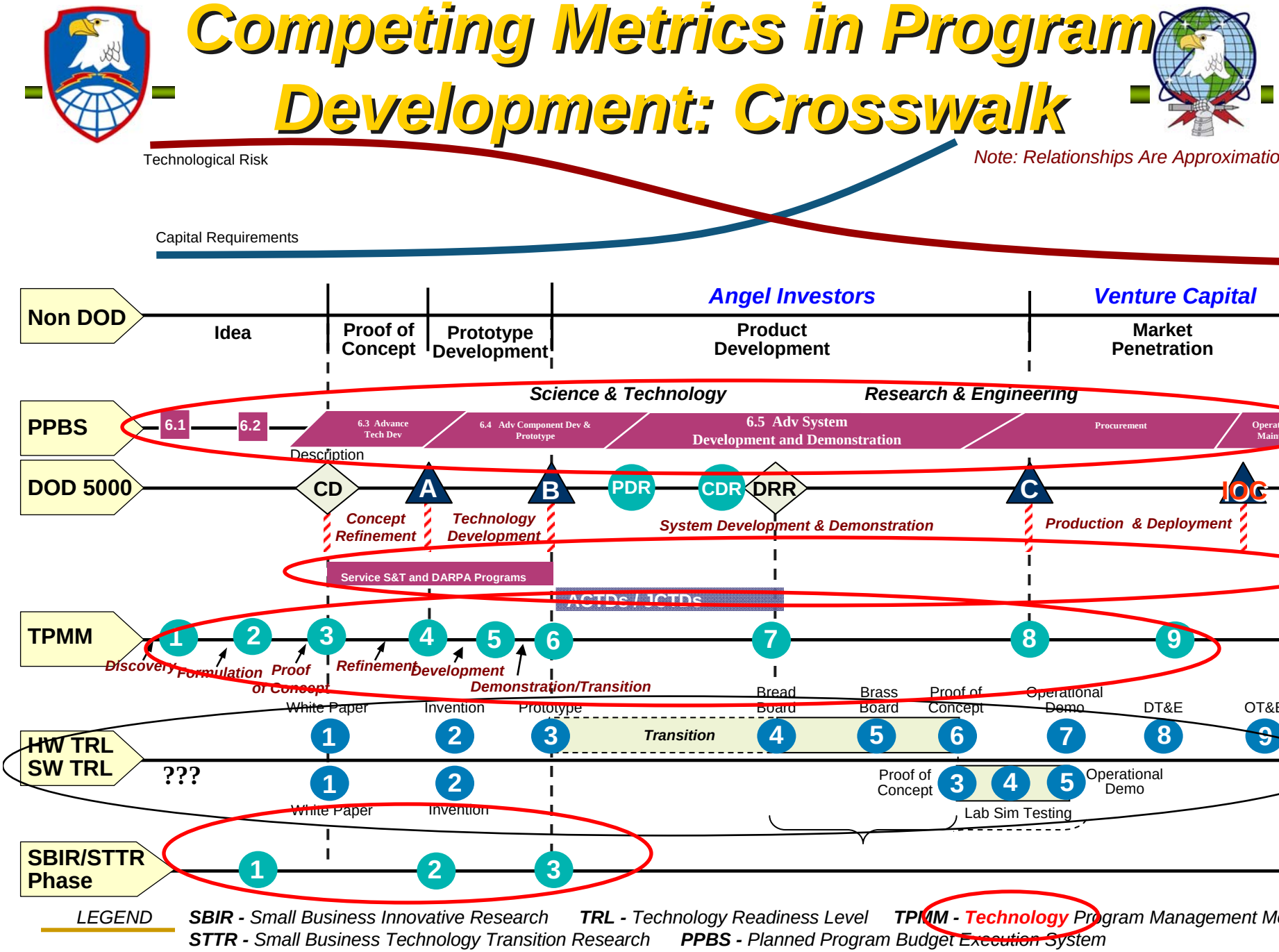
Competing Metrics in Program Development: Crosswalk



LEGEND

SBIR *- Small Business Innovative Research* ***TRL*** *- Technology Readiness Level* ***TPMM*** *- Technical Program Management Model*
STTR *- Small Business Technology Transition Research* ***PPBS*** *- Planned Program Budget Execution System*

Competing Metrics in Program Development: Crosswalk

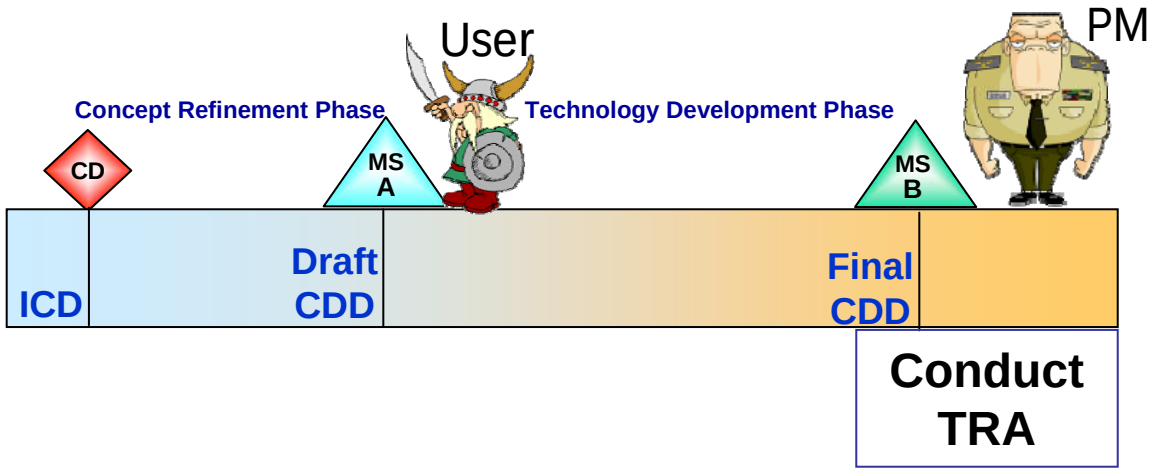


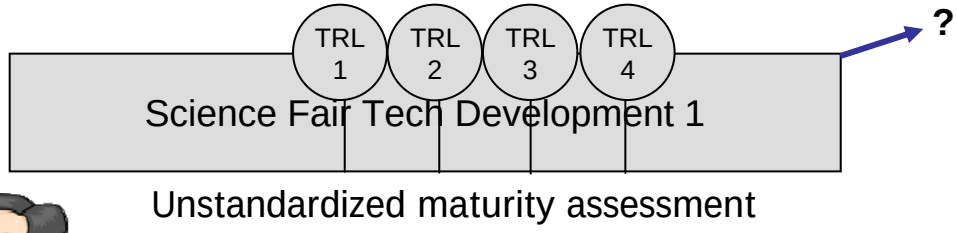
LEGEND

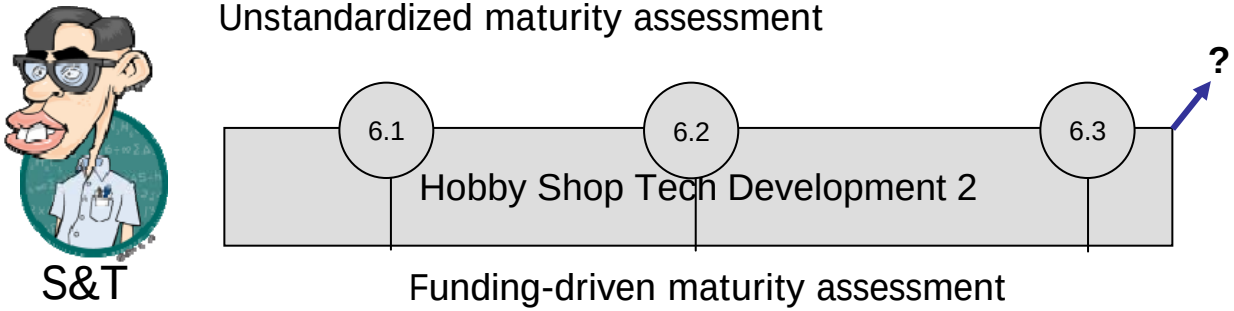
SBIR *- Small Business Innovative Research* ***TRL*** *- Technology Readiness Level* ***TPMM*** *- Technology Program Management Model*

STTR *- Small Business Technology Transition Research* ***PPBS*** *- Planned Program Budget Execution System*

Why Do Immature Technologies Transition?







"Perspective of the USER"

I'm governed by the JCIDS

Hey Buddy - I OWN The Requirements!

I Want it All!!
I Want it Cheap!
I Want it Now!

Gotta be small, lightweight, and 99.99% reliable

I am understaffed to do that

USER

- Threat Driven
- Soldier-Proof
- Fieldable
- Meets Mission Needs
- **DOTMLPF**

"Perspective of PM"

I am governed by DoD 5000.

Your next chance for funding is 5 years down the road – stud!

I NEED a REQUIRMENT (CDD)!

My prime can do that!!

You forgot about the "illities"!!!

•Reliability	•Affordability	•Producibility
•Availability	•Interoperability	•Technical Data
•Survivability	•Transportability	•Safety And Health Hazards
•Maintainability	•Environmental	•Supportability
•Deployability	•Maintainability	•Supply
•Sustainability	•Manufacturing	•Equipment
•Human Factors		•Manpower And Personnel

- Value Added
- Capability
- Probability of Success
- Acquisition Strategy
- Budget (LLC/POM)
- Schedule - WBS
- The System " approach"

"Perspective of S&T"

S&T Project

- Technical "break-thru"
- Performance Goals
- Risk
- Cost Estimate.
- Program Plan
- Build a prototype

You don't understand - This project is different from everyone else

My S&T job is my life - If I finish it – then what?

S&T does not require a process – I have been doing it for years

Customer role is to integrate

Marketing is not part of S&T

If you "Push" long enough – they will come!

Transitioning Technology

Technology Management vs. Transition Management

Transition Management ••••••••••→

- **Transition an afterthought**
- **Technologist still tinkering**
- **Not knowing when you're finished**
- **Not knowing when technology is needed**

Typical Paradigm

Technology Management ——————→

Technology Readiness Levels
DoD 5000.2-R

1. Basic principles observed and reported.	Lowest level of technology readiness. Scientific research begins to be translated into technology's basic properties.
2. Technology concept and/or application formulated.	Invention begins. Once basic principles are observed, practical applications can be invented. The application is speculative and there is no proof or detailed analysis to support the assumption. Examples are still limited to paper studies.
3. Analytical and experimental critical function and/or characteristic proof of concept.	Active research and development is initiated. This includes analytical studies and laboratory studies to physically validate analytical predictions of separate elements of the technology. Examples include components that are not yet integrated or representative.
4. Component and/or breadboard validation in laboratory environment.	Basic technological components are integrated to establish that the pieces will work together. This is relatively "low fidelity" compared to the eventual system. Examples include integration of "ad hoc" hardware in a laboratory.
5. Component and/or breadboard validation in relevant environment.	Fidelity of breadboard technology increases significantly. The basic technological components are integrated with reasonably realistic supporting elements so that the technology can be tested in simulated environment. Examples include "high fidelity" laboratory integration of components.
6. System/subsystem model or prototype demonstration in a relevant environment.	Representative model or prototype system, which is well beyond the breadboard tested for level 5, is tested in a relevant environment. Represents a major step up in a technology's demonstrated readiness. Examples include testing a prototype in a high fidelity laboratory environment or in simulated operational environment.
7. System prototype demonstration in an operational environment.	Prototype near or at planned operational system. Represents a major step up from level 6, requiring the demonstration of an actual system prototype in an operational environment. Examples include testing the prototype in a test bed aircraft.
8. Actual system completed and qualified through test and demonstration.	Technology has been proven to work in its final form and under expected conditions. In almost all cases, this level represents the end of true system development. Examples include developmental test and evaluation of the system in its intended weapon system to determine if it meets design specs.
9. Actual system proven through successful mission operations.	Actual application of the technology in its final form and under mission conditions, such as those encountered in operational test and evaluation. Examples include using the system under operational mission conditions.

Technology Readiness Levels DoD

1. **Basic pri** ...st level ... ...egins to be translated into **re** ...'s ba...
2. **T** ...s. Once bas... ...served, practical applications can be invented. The ...eculative and th... ...o proof or detailed an... ...sumption. ...l limited to pap... ...dies.
3. **A** ...and developmen... initiated. This incl... ...ory studies **c** ...late analytical pr...dictions of separate ...ples **charac** ...that are ...rated or repre...
4. **Component and/or breadboard validation** ... Basic technological c... ...establish t... ...together. This is relatively "low fid... ...tual system. Examples include integration of "ad hoc" hardware in a labo...
5. **C** ...of breadboard tech... ...ases sig... ...tly. The basic ...tegrated with reasonably ...pporting element... ...mulated environment. Ex... ...clude "high fidelity" labora...
6. **Sys** ... Representative ...odel or ... ...stem, which is well beyo... **proto** ... tested in a ...levant enviro... Represen... major step up ... **relevant environment.** ... readi... Examples include testing a prototy... ...n a high fidelity ...ated operational envir...ment.
7. **System prototype demonstra** ... Prototype near or at plan... operational system. ... ...sents a major step up from level 6, requiring **in a** ... the demonstration of a... ...al system prototype in a... ...ironment. Examples include testing the prototy... ...bed aircraft.
8. **** ... Tech... ...in its fina... ...ons. In almost all ca... ...ue sys... ...de developmental te... ...tended... ...t meets design sp...
9. **Actual syst... through successful mission operations.** ... Actual ... ...in its final form and u... ...conditions, such as those encountered in o... test and evaluation. Examples include using the system under operational mission conditions.

In what way will this technology Add Value to the End User?

What Programmatic & System Engineering tasks should be performed during each Stage of Development?

When should I know who my Customer is?

When should I know what the requirements for the technology are?

At what point will the technology be transitioned to a Customer?

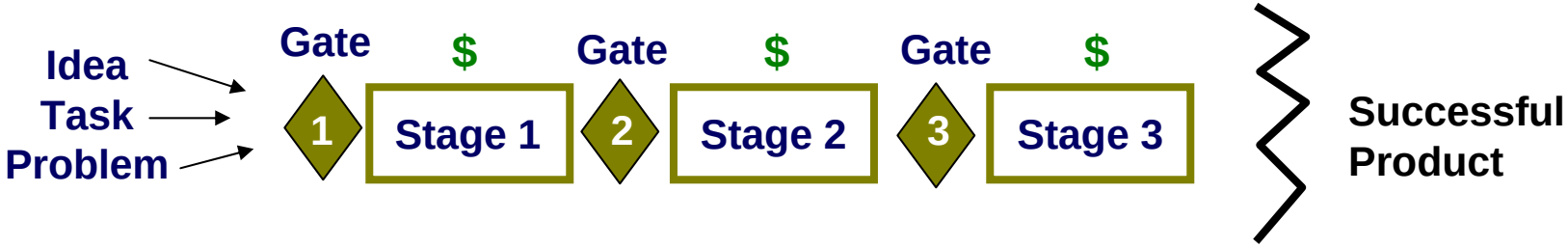
How will my progress be measured?

What are the criteria for completing a TRL?

What is the definition of a success?

Basic Stage Gate Process

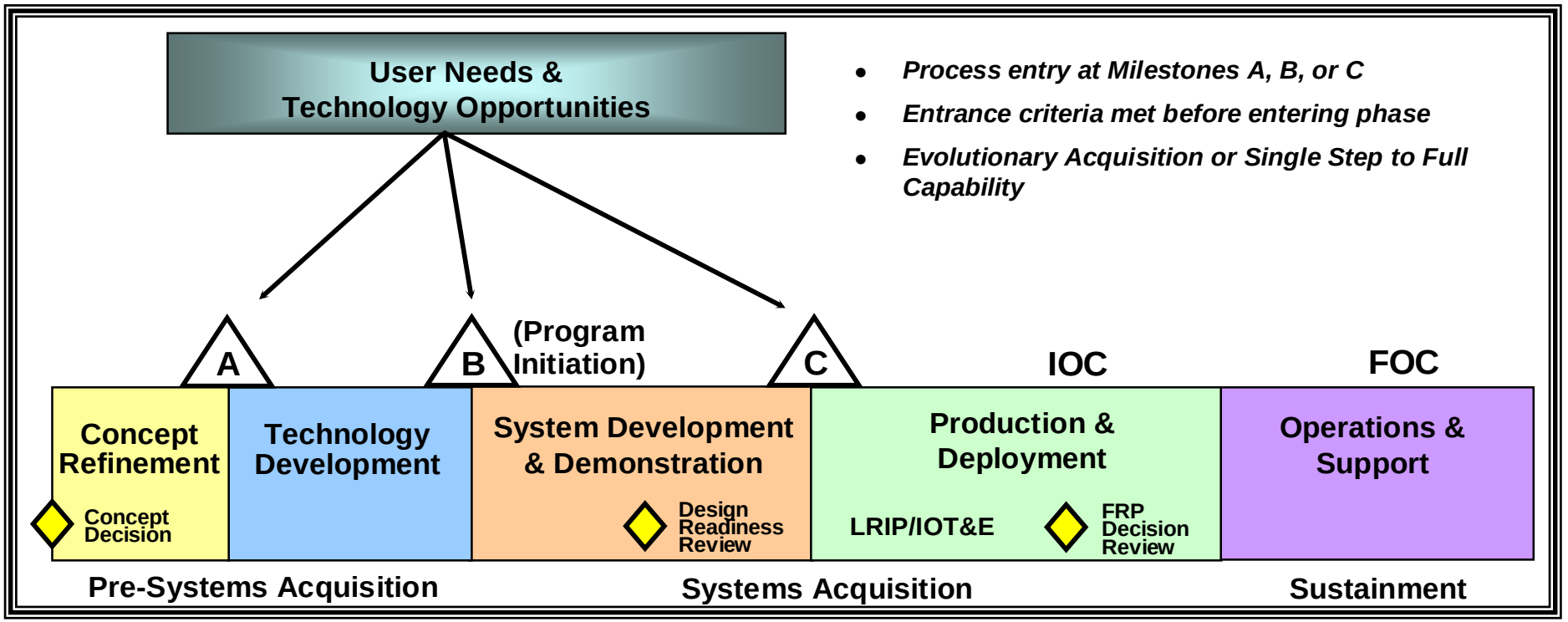
Stage – Gate Type Process – all businesses have "a process"



- Each Gate is a decision point for the program to move to the next stage.
  - Decision to Go / Kill / Hold / Recycle
- Each Stage is measured by:
  - Metrics Goals
  - (Exit Criteria)
  - Deliverables
  - Funding allocation

Everything We Do is a Process

First TRA Requirement



DoD 5000 Metric

- Technology Readiness Assessment (TRAs) - Required at MS B
- TRAs using Technology Readiness Levels (TRLs)

Solution?

According to a GAO review of 54 DoD programs:

- Only 15% of programs began SDD [after MS B] with mature tec
  -
  -
- At de
  - Design stability not achievable with immature technologies
  - Programs with stable designs at CDR averaged 6% cost growth
  - Programs without stable designs at CDR averaged 46% cost growth and a 29 month schedule delay

A *standardized assessment process* based upon a System Engineering- and Programmatic-based TRL criteria set applied *earlier* in the process.

Source: Defense Acquisitions: Assessments of Selected Major Weapon Programs, GAO-05-301, March 2005

Transitioning Technology

Technology Management vs. Transition Management

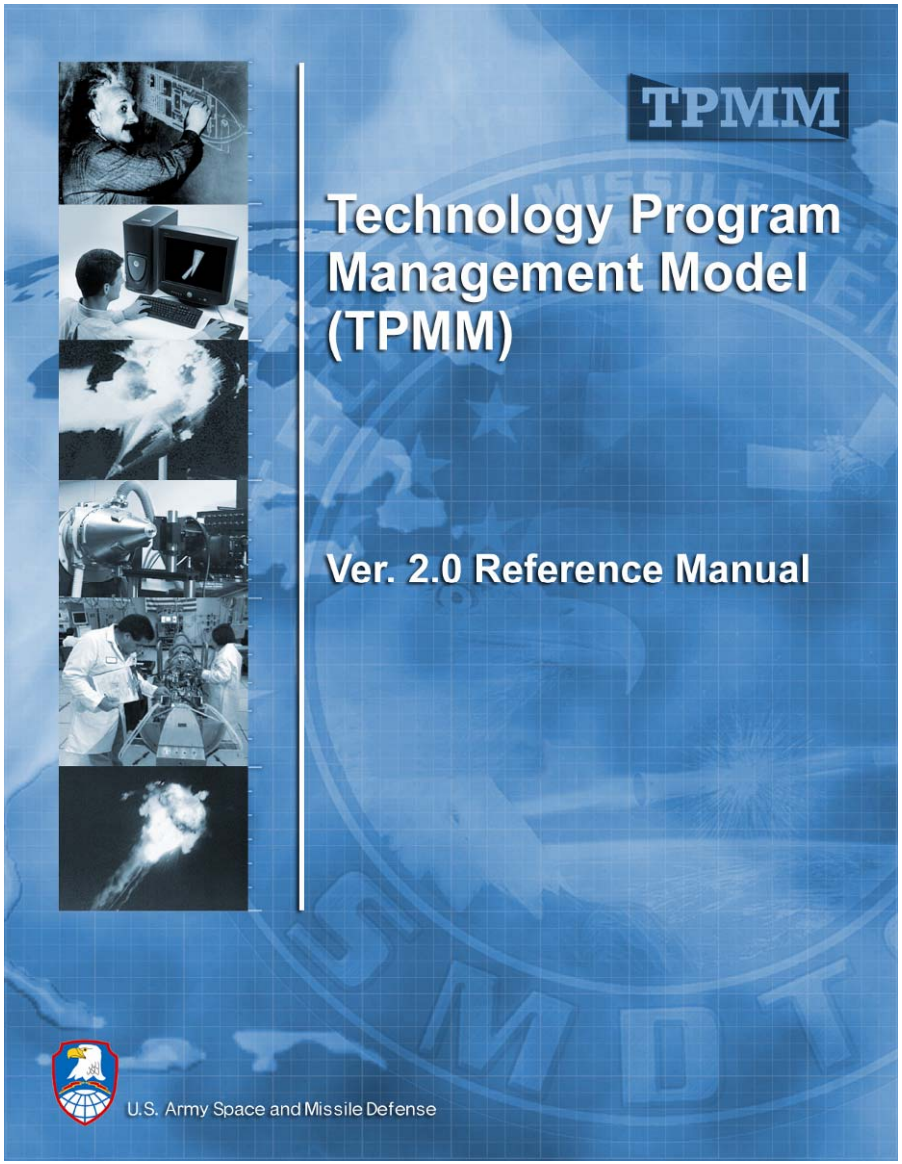
Transition Management

- **Transition an afterthought**
  - ***Integrated Transition Management***
- **Technologist still tinkering**
  - ***Technology Readiness Assessments***
- **Not knowing when you're finished**
  - ***Technology Advancement Assessments***
- **Not knowing when technology is needed**
  - ***Technology Transition Agreements***

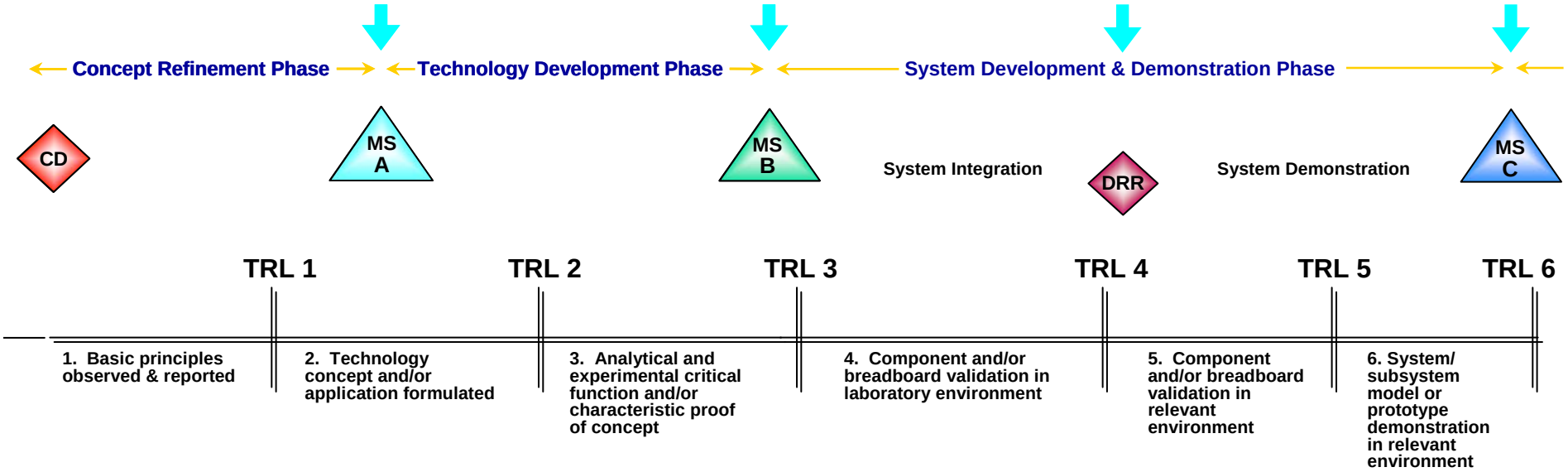
Balanced Paradigm

Typical Paradigm

Technology Management

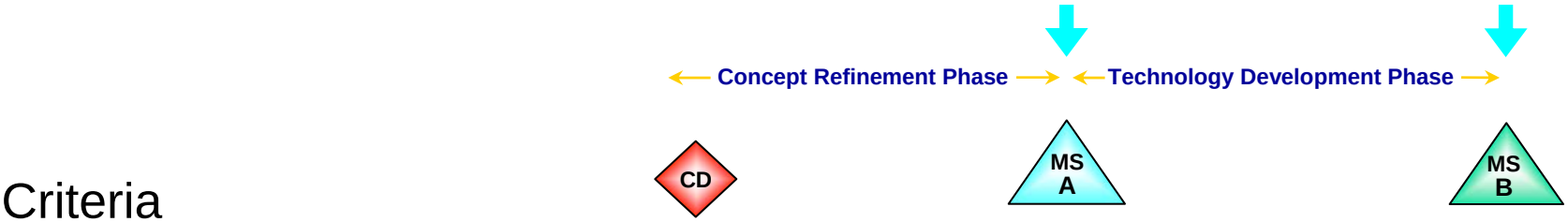

TPMM
Technology Program Management Model (TPMM)
Ver. 2.0 Reference Manual
U.S. Army Space and Missile Defense

Aligning TRLs & DoD 5000



S&T Community Activities

Aligning TRLs & DoD 5000

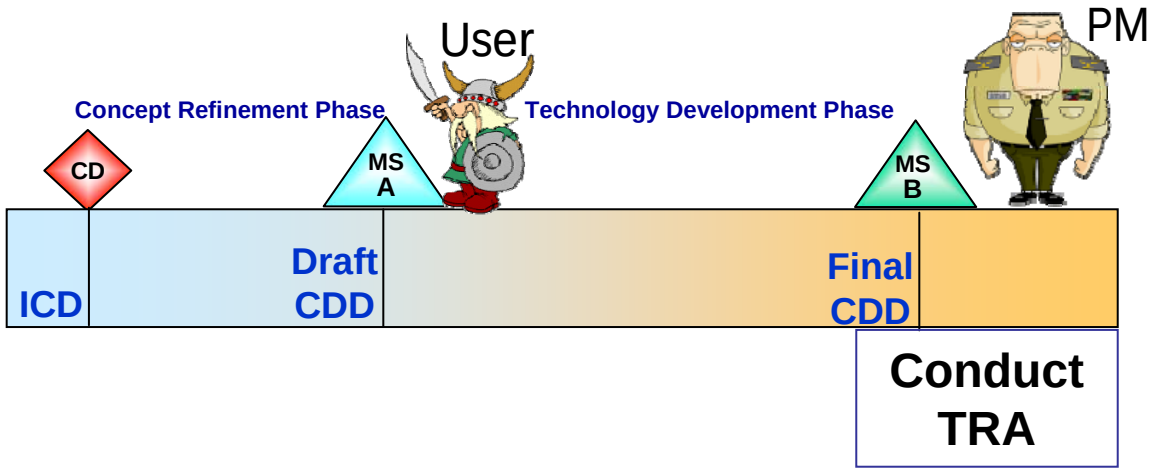


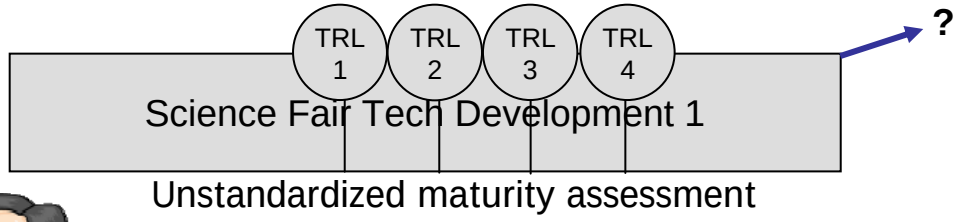
TPMM Criteria

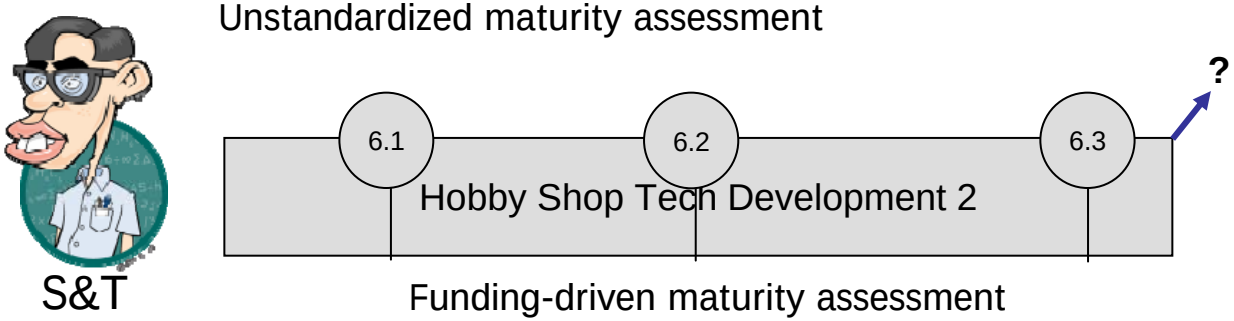
TRL 1	TRL 2	TRL 3	TRL 4	TRL 5	TRL 6
1. Basic principles observed & reported	2. Technology concept and/or application formulated	3. Analytical and experimental critical function and/or characteristic proof of concept	4. Component and/or breadboard validation in laboratory environment	5. Component and/or breadboard validation in relevant environment	6. System/ subsystem model or prototype demonstration in relevant environment
Discovery	**Formulation**	**Proof of Concept**	**Refinement**	**Development**	**Demonstration Transition**
Develop an Idea Based on Threat, need, User Rqmt, Other Identify Pertinent Military Application & a Potential Customer(s)	Develop a Concept Conduct Trade Studies Perform Military Utility Analysis Perform Paper Studies Identify specific customer(s) Analysis of Alternatives	Proof of Concept and approach Develop General Technical Requirements ID cross technologies Develop Draft Tech Development Strategy ***TTA - Interest***	Demonstrate Key Technologies Work Together Refine Requirements System Eng Plan Update Tech Development Strategy ***TTA –Intent***	Demonstrate Components Work With/as System Finalize Requirements Develop Transition Plan and Gain Customer Approval	Demonstrate Prototype Ready for Operations Demonstrate Increased Capabilities Develop Transition Agreement Acquisition Strategy ***TTA – Commitment***

"Secure the High Ground"

Why Do Immature Technologies Transition?

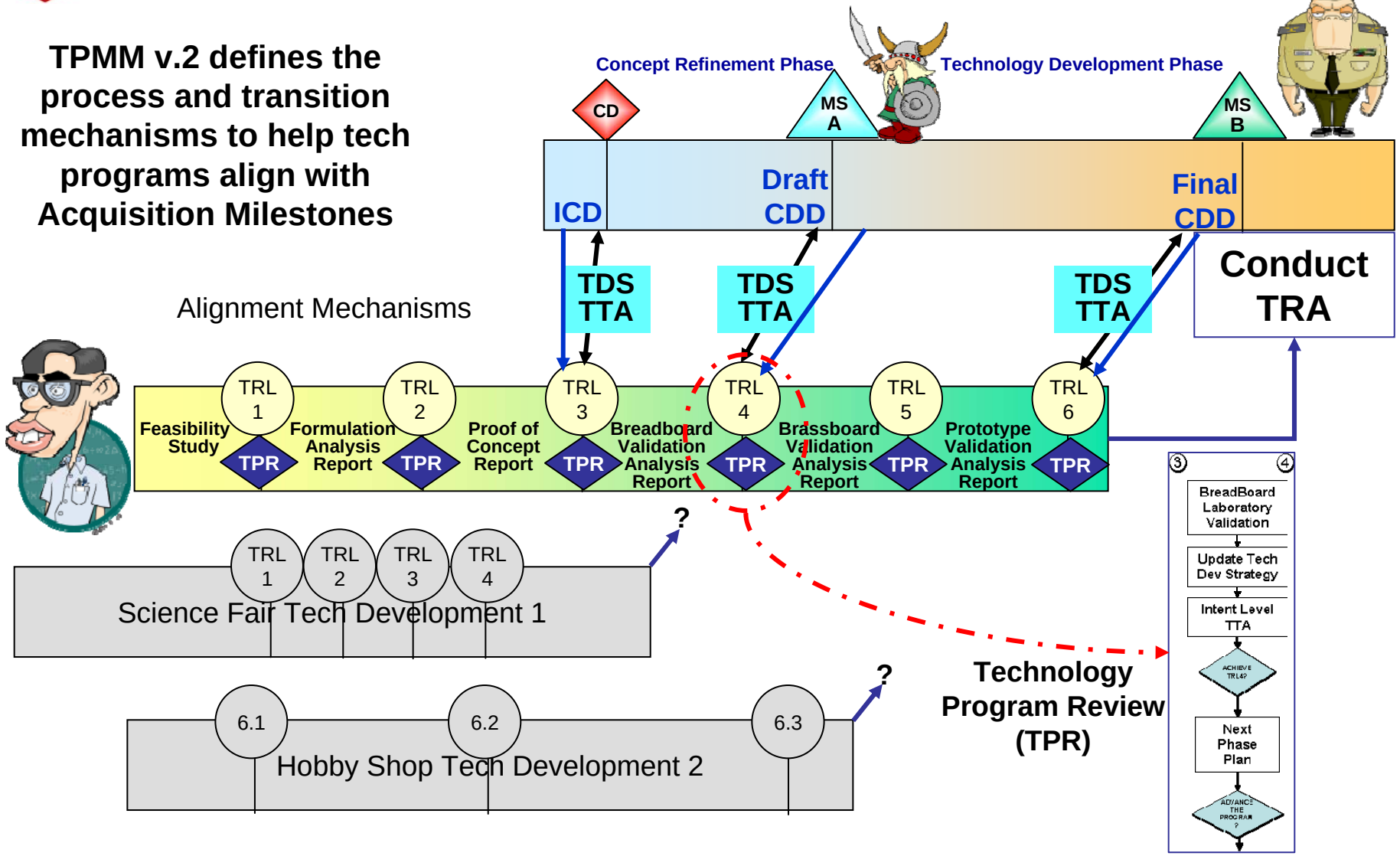




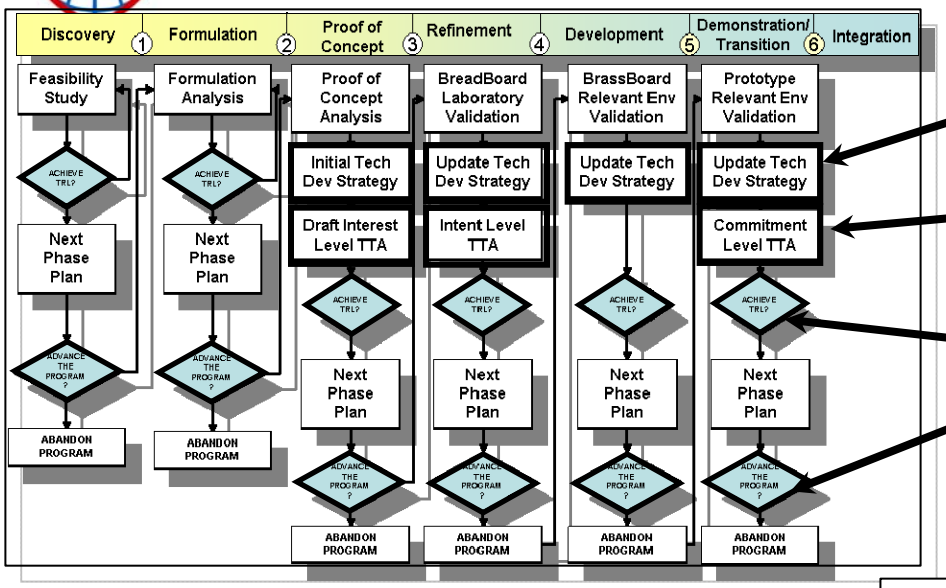


Aligning the Technology with DoD 5000 MS's

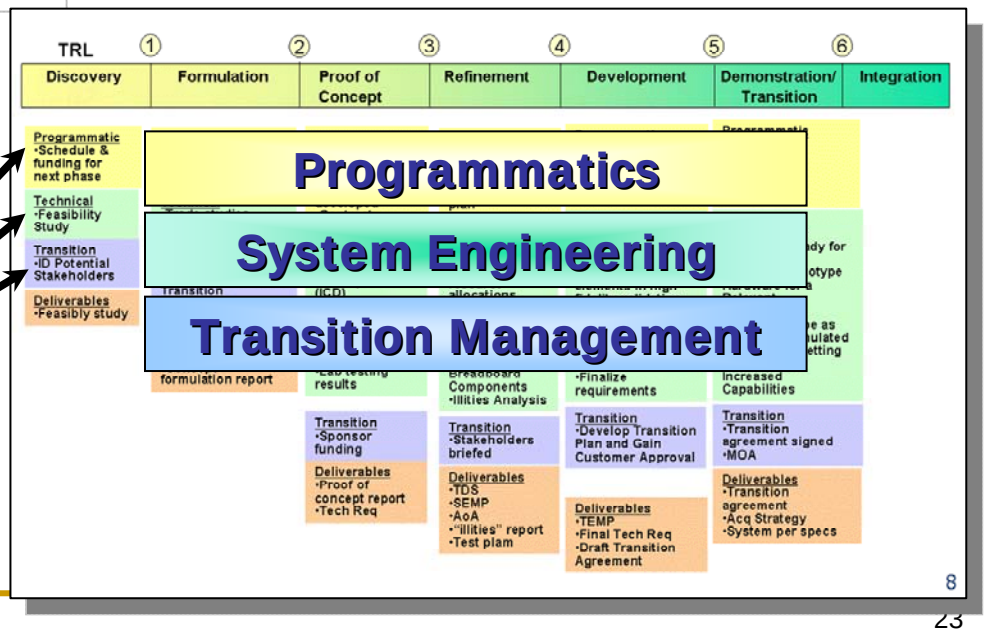
TPMM v.2 defines the process and transition mechanisms to help tech programs align with Acquisition Milestones



Systematic Development Process



- TDS establishes common language and vision
- DAU adopted TTA
- Program reviews include a TRA and a TAA



- Multi-Dimensional criteria set provides a comprehensive TRL Assessment

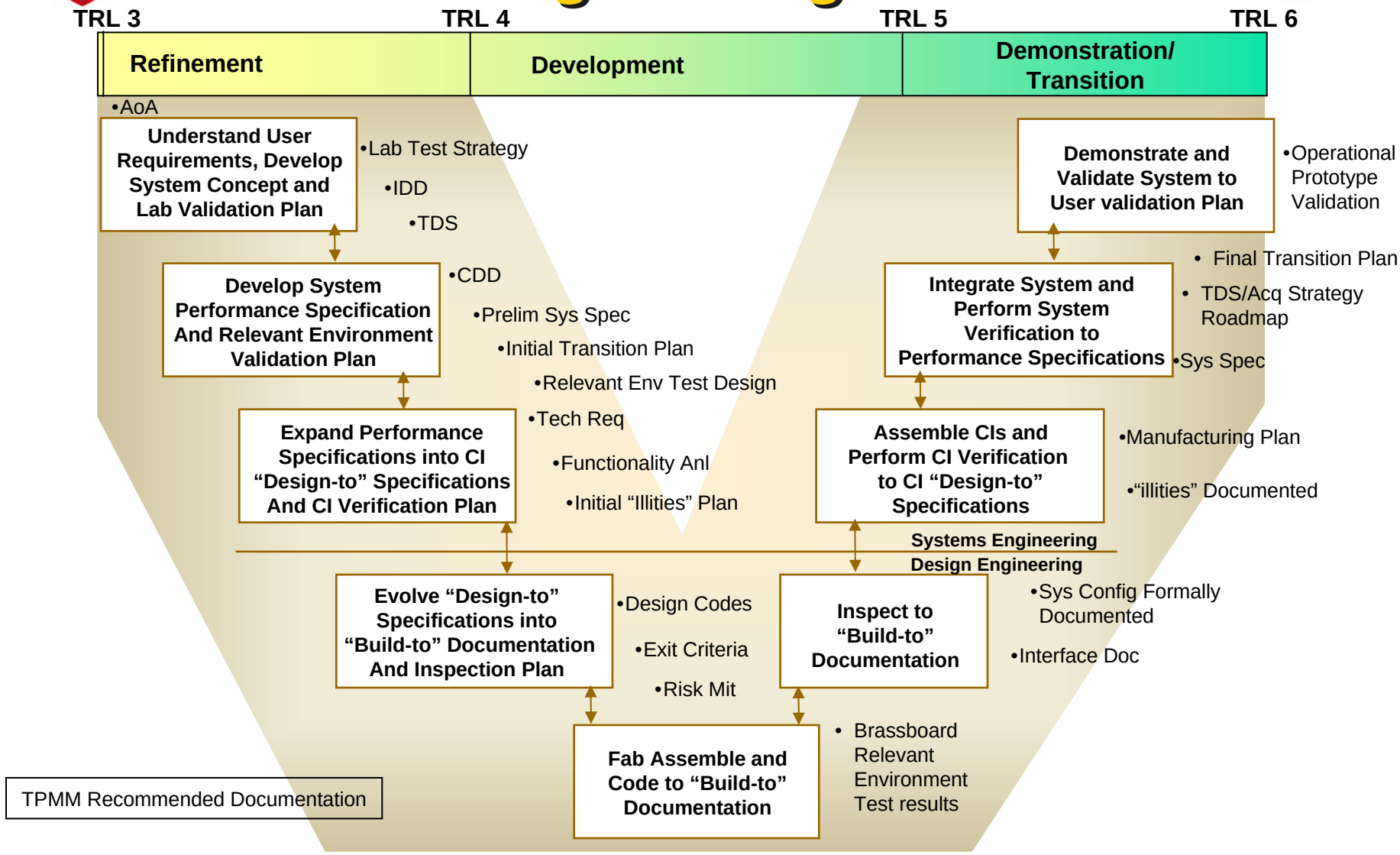
Implement New Technology Transition Agreement (TTA)

Helping manage the Technology Transition by

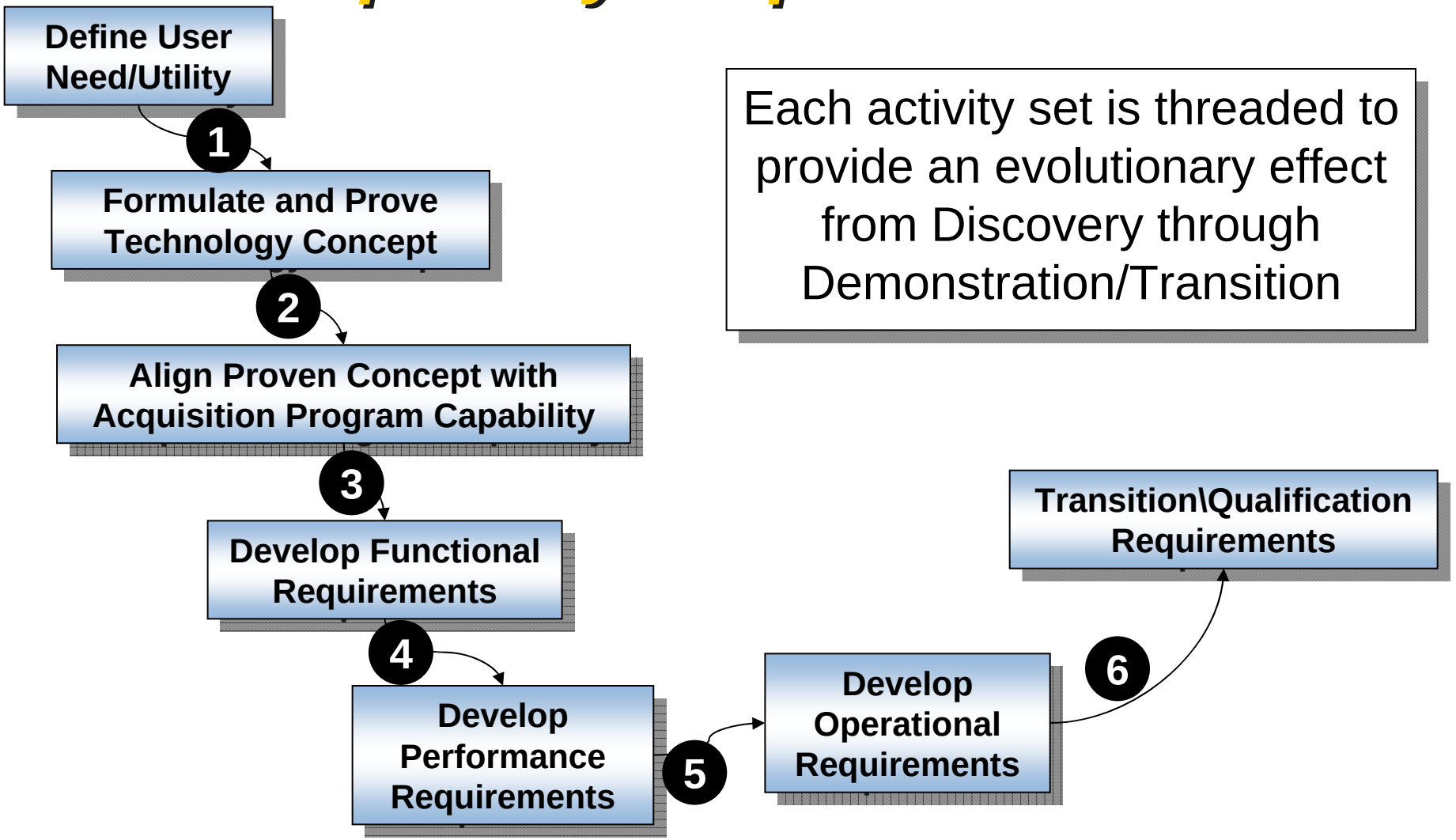
- formalizing development requirements
- establishing timelines for technology insertion
- establishing plans for integration into target Acquisition environment

Key Indicators	Description	TTA Version		
		Interest	Intent	Commitment
Performance Requirements	Definitive, complete, measurable performance & physical attributes parameters to be tracked.	Not Likely	Yes	Yes
Performance Thresholds	Minimum acceptable performance threshold has been identified	Not Likely	Yes	Yes
Performance Demonstrated	Current performance of the technology/product	Maybe (Simulated)	Yes - Lab	Yes - Relevant Environ
Test Planning	Conditions under which technology/product will be tested/demonstrated prior to delivery to acquisition	Not Likely	Yes - Lab	Yes - Relevant Environ
Operational Environment	The environment in which the technology will operate has been defined	Maybe	Yes	Yes
TRL at Transition	Estimate of the transition TRL coordinated with the program office	Maybe	Yes	Yes

TPMM v.2 & the System Engineering V

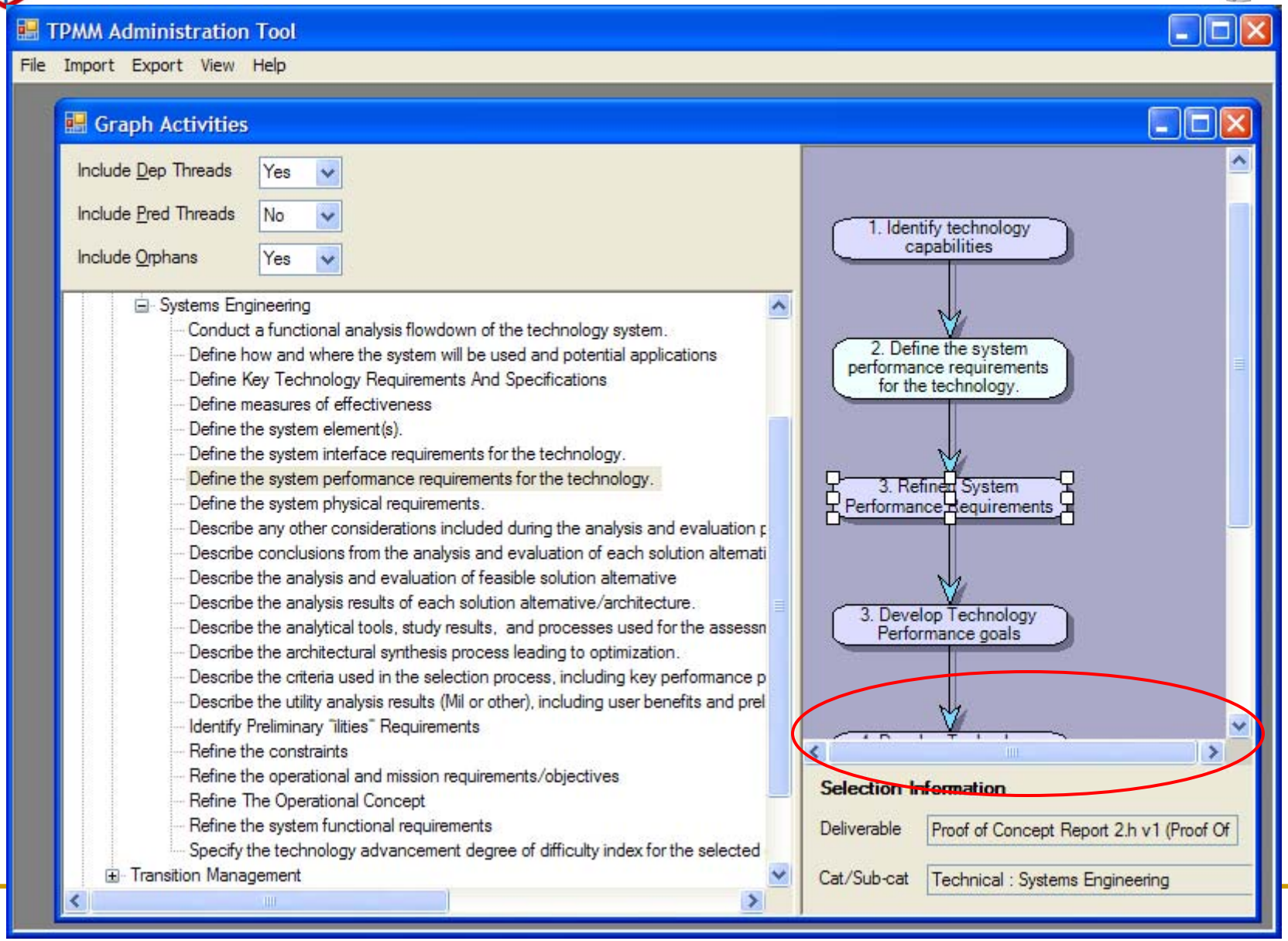


Example Thread - Capability/Requirement



Each activity set is threaded to provide an evolutionary effect from Discovery through Demonstration/Transition

System Engineering Threads

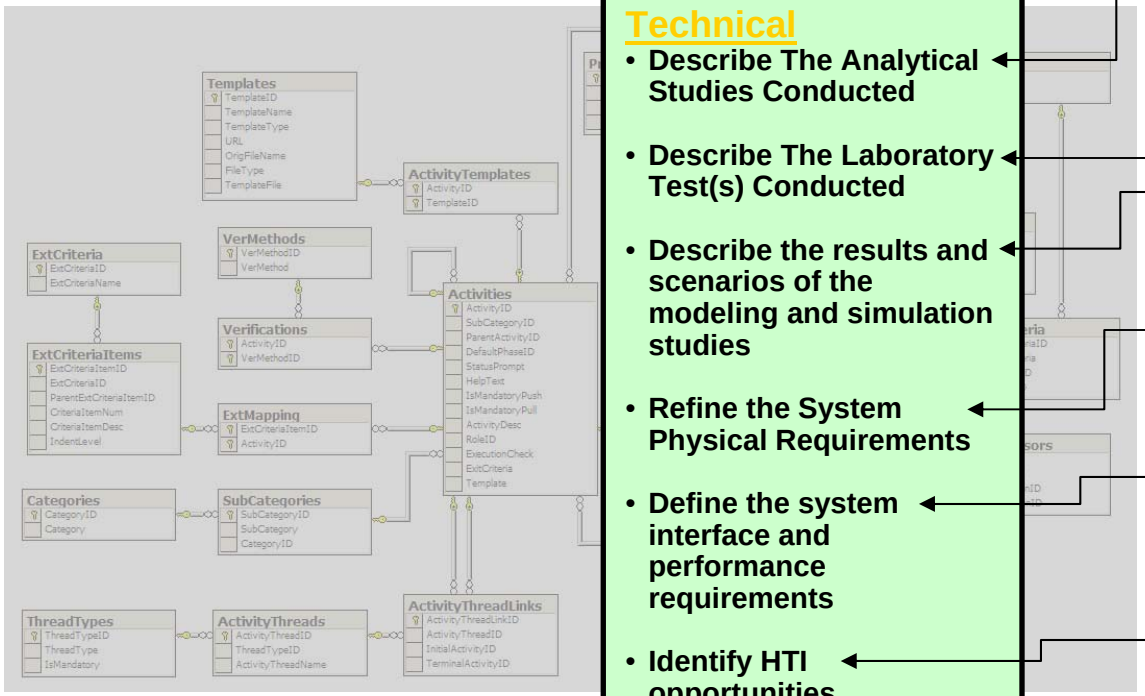


TPMM supports RL integration

TRL 2 3

Proof of Concept

TPMM Activities



Technical

- **Describe The Analytical Studies Conducted**
- **Describe The Laboratory Test(s) Conducted**
- **Describe the results and scenarios of the modeling and simulation studies**
- **Refine the System Physical Requirements**
- **Define the system interface and performance requirements**
- **Identify HTI opportunities**
- **Models And Simulations Develop/Update/Validate**

MDA/AS EMRL for TRL 3

3.1.a	Performance predictions of elements of technology capability validated by Analytical Studies details
3.1.b	Performance predictions of elements of technology capability validated by Laboratory Experiments details
3.1.c	Performance predictions of elements of technology capability validated by Modeling and Simulation details
3.2	Scaling studies have been started. Define the goals of the studies and how the goals relate to the BMDS mission.
3.3	Preliminary performance characteristics and measures have been identified and estimated. Quantify level of performance.
3.4	Cross technology effects (if any) have begun to be identified. Identify other new or in development technology that could increase performance and reduce risk.
3.5	Design techniques/codes have been identified and defined to the point where small applications may be analyzed/simulated. Provide details.

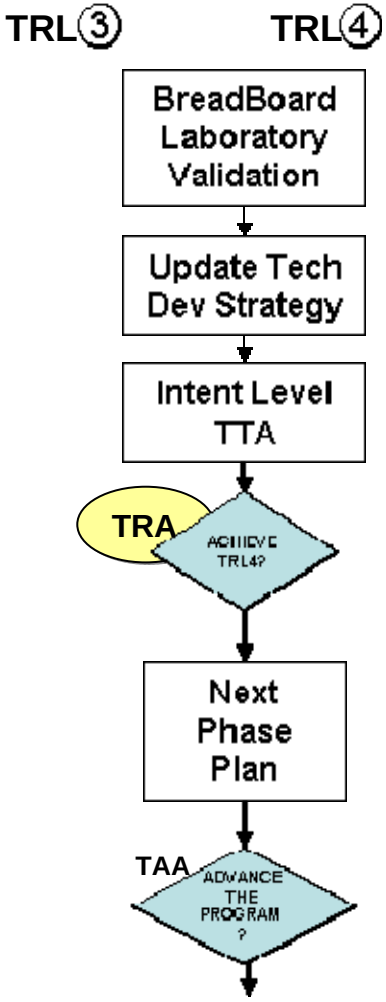
TPMM v.2
Technology Readiness Assessment Criteria

Refinement Phase (TRL 4) Assessment Criteria Checklists

A Breadboard Laboratory Validation Report Was Completed	Check
The explanation of objectives of the breadboard laboratory validation analyses and testing are sufficient.	☐
The various test configurations were adequately explained and the key functions and subsystems of each were identified.	☐

The Technology Development Strategy was Updated (Part 1)	Check
A project organization has been documented that includes roles and responsibilities	☐
Sponsor for this technology development been identified	☐
A Customer (acquisition program) for this technology development been identified	☐

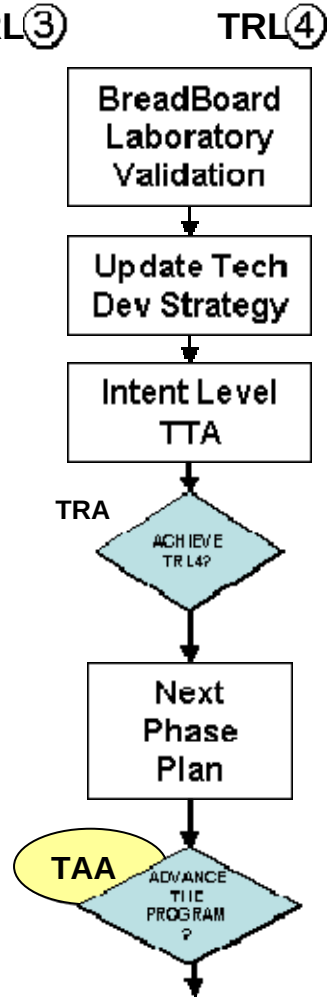
The Technology Transition Agreement was Updated	Check
The status to the current state of the technology development and transition activity is provided.	☐
The current state of development has been Summarized	☐
The appropriate version of TTA has been developed	☐
Exit Criteria for Transition Has beed determined	☐
A Requirements Officer and Capability Requirement Basis have been identified.	☐
Major program objectives have been developed	☐
Projected initial operational capability date is reasonable and has been coordinated with the Target Acquisition Program	☐
Identify personnel responsible for day-to-day program/project management	☐
The technology needs of the acquisition program that S&T is expected to provide have been identified	☐
Relatative benefit to meeting specific Acq Program Capability has been shown	☐
Realistic Need Dates for meeting Specific Capabilities were developed	☐
The estimated Technology Readiness Level (TRL) for each technology/product need identified was Valid and has been Effectively Coordinated between the S&T group and the Acquisition Program.	☐
The process for integrating the technology/product into the acquisition program was adequately described.	☐
Identify the Sustainment officer responsible for identifying resourcing and executing Sustainment after transition. Include contact information.	☐
The present version of TTA has been approved and signed by all necessary parties.	☐



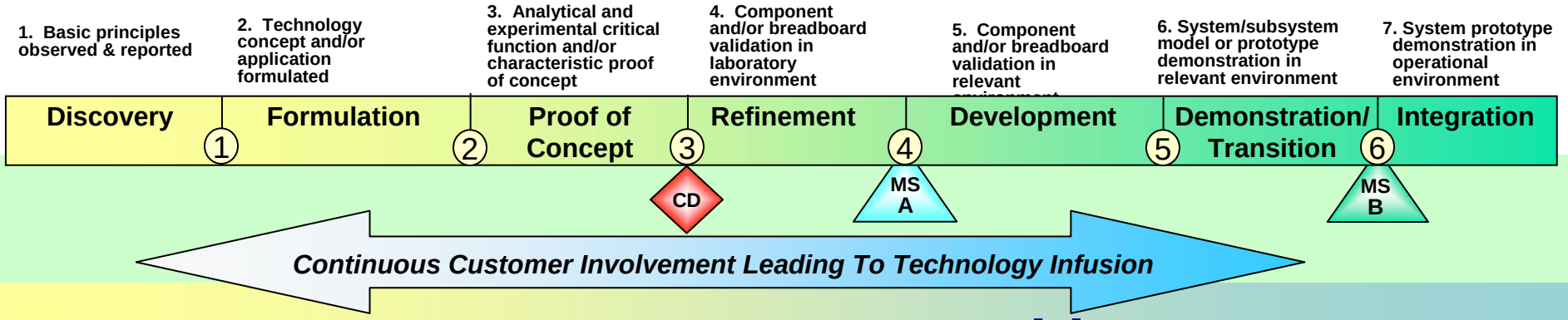
TPMM v.2
Technology Advancement Assessment Criteria

Development Phase (TRL 5) Entry Criteria Checklist (partial)

Develop a Brassboard Laboratory Validation Plan for use in Development	Check
A Brassboard Laboratory Validation Plan was developed	☐
The purpose described for validation testing is adequate	☐
The explanation of objectives of the Brassboard laboratory validation analyses and testing are sufficient.	☐
The key performance parameters of the system that will be validated were properly identified	☐
The various test configurations were adequately explained and he key functions and subsystems of each were identified.	☐
Items to be tested in the Brassboard Laboratory Validation were identified	☐
The Testing environment was sufficiently described	☐
All external systems participating in the test were identified	☐
All organizations participating in the tests to include any external organizations were identified.	☐
A schedule which shows a timeline for each planned test was provided.	☐
All operational considerations for each test were described.	☐
The methods for determining results based on content, quality, quantity, completeness, were described.	☐



TPMM Value-added



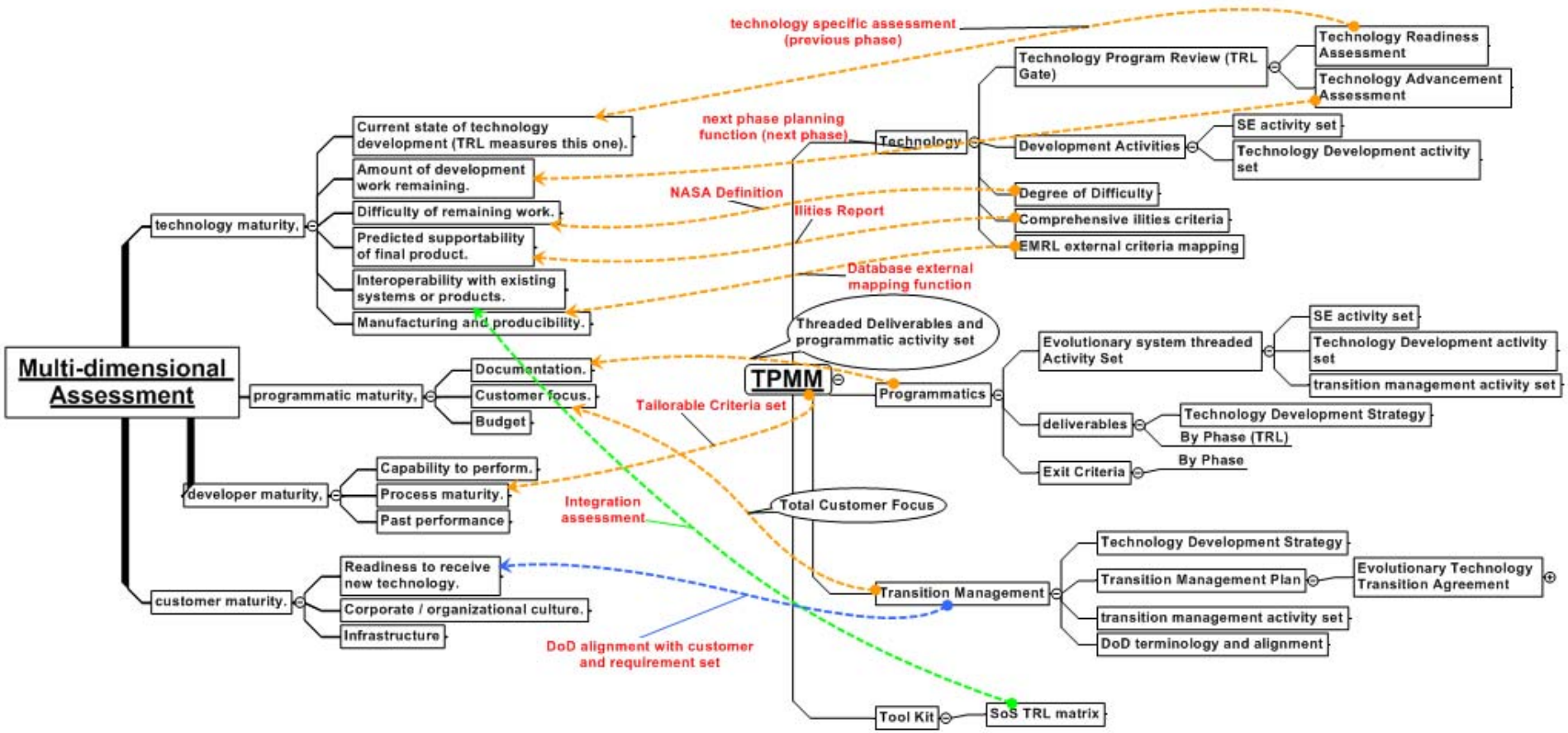
Transition Management

- Defines activity-based phases and gate reviews for each TRL (TPR)
- Establishes exit criteria & deliverables for each phase (TRA)
- Reinforces System Engineering and Programmatic Principles (TAA)
- Facilitates alignment of S&T with Acquisition Programs
- Early focus on successful transitioning (Evolutionary TTA)

Technology Management

Standardized Management Model
For Technology Maturation

TPMM Related to MDATM



TPMM Summary

Increases the probability of successfully fielding the right technology solution at the right time by:

- Standardized process based on a validated development model
  - Provides a system-engineered activity set consisting of technical, programmatic, and transition management activities
  - Establishes common language
  - Supports continuous improvement through incorporation of lessons learned across enterprise
  - Reduces gaps in program execution to successful transition
- Standardized TRL-based Technology Readiness Assessment
- Provide consistency in Development method and execution

Increases productivity of program management enabling an S&T Organization to be more responsive to emerging needs such as:

- Fulfillment of the DoD 5000 technology development & assessment process
- Real-time enterprise-level TRL-based metrics for all S&T Programs
- Visibility into all aspects of the program portfolio execution
  - Program Justification (Auditing)
- Answer Maturity Trade-off requests
  - Tools for self-assessment of technology maturity for down selection

Q&A

Jeff.Craver@US.Army.Mil

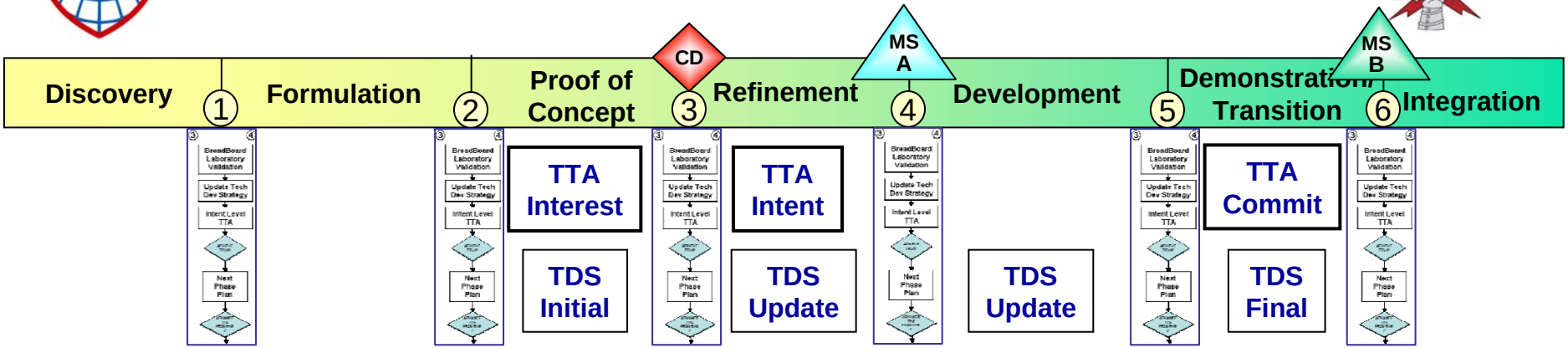
256-955-5392

256-337-6557

http://www.tpmm.info

Additional Info

TPMM is an ACTIVITY model



- Show a Capability
- Identify Pertinent Military Application & Potential Customer

- Identify specific
- customer(s)
- Perform Military Utility Analysis
- Cultivate Sponsorship

- Develop Initial Operational Req's (ICD)
- Customer & USER briefed

- Refine Operational Req.
- Funding obtained for Dev & Demo

- Develop Transition Plan and Gain Customer Approval

- Final Req (CDD)
- PM's Acquisition Strategy Roadmap
- Demonstrate Prototype Ready for Operations

Transition Management

- Develop an Idea Based on Threat, need, User Rqmt, Other

- Develop a Concept
- Conduct Trade Studies
- Perform Paper Studies

- Proof of Concept and approach
- Analysis of Alternatives
- ID cross technologies

- Demonstrate Key Technologies Work Together
- System Eng Plan

- Demonstrate Components Work With/as System
- Finalize Requirements

- Demonstrate Increased Capabilities

Technology Management

Program Management

Develop and Manage Program Plan

ERINT Program Plan Schedule w/ TPMM Overlay

TRL 1 | TRL 2 | TRL 3 | TRL 4 | TRL 5 | TRL 6 | TRL 7, 8 & 9

CALENDAR YEAR: 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000

Formulation | Proof of Concept | Refinement | Development | Demonstration / Transition | Integration

Endo-HTK Concept Formulation/ Exploration

- Concept Devel
- Quick Shot
- ACS Technology
- Hi-Pwr Supply Tech
- Other Critical Tech

- Define HTK MSL Concepts
- Prove ACM Concept Feasibility
- Explore Hi-Power/Light Weight Power Supplies

PAC III MILESTONE IV DAB

LRIP DAB

ERINT Development

INITIAL FLIGHT: SRHIT/FLAGE (3) FLTS

FINAL FLIGHT: FLAGE Follow-On

- Design HTK Prototype
- HTK Missile Proof-of-Principle

ERINT Demonstration/ Validation

- Design/Develop Tactical HTK Missile
  - Stand Alone
  - Integrated Into PATRIOT
- Demonstrate Tactical Feasibility

Initial Flight | Final Flight

Design | Assembly. & Ground Test | Test

Initial Prototype Tests

PAC-III Missile EMD/ Production

- Determine "Best" PAC III Missile
- Design and Integrate Tactical PAC III Missile

PAC-III Downselect Review

ERINT vs TRI-Made

SRR | OR | First Flight | Last Flight | FDTE

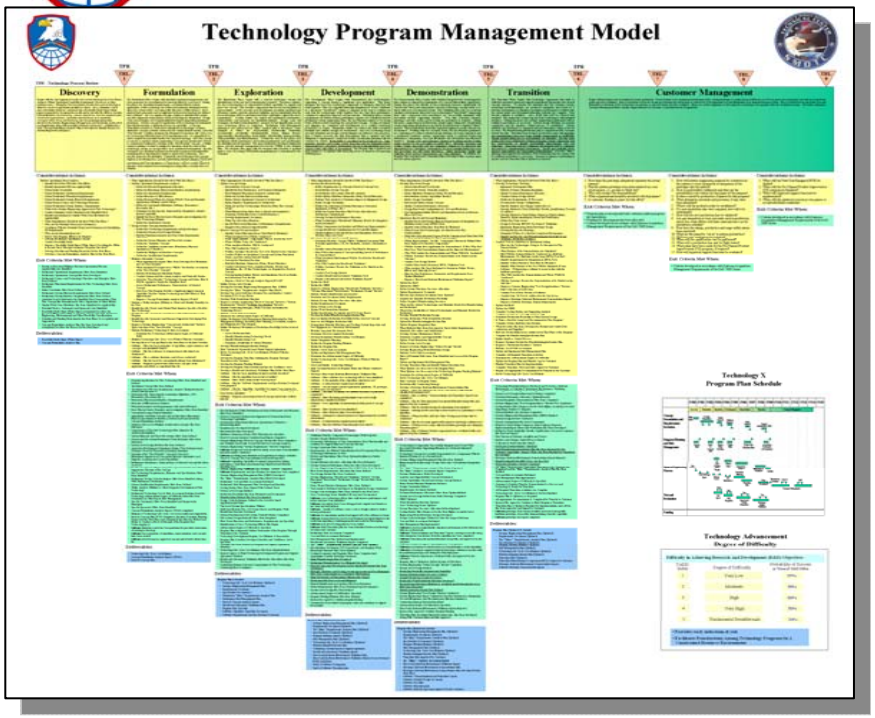
Design | Integrate | Test

PATRIOT/ERINT INTEGRATION

LRIP

"Secure the High Ground"

What's New in Version 2

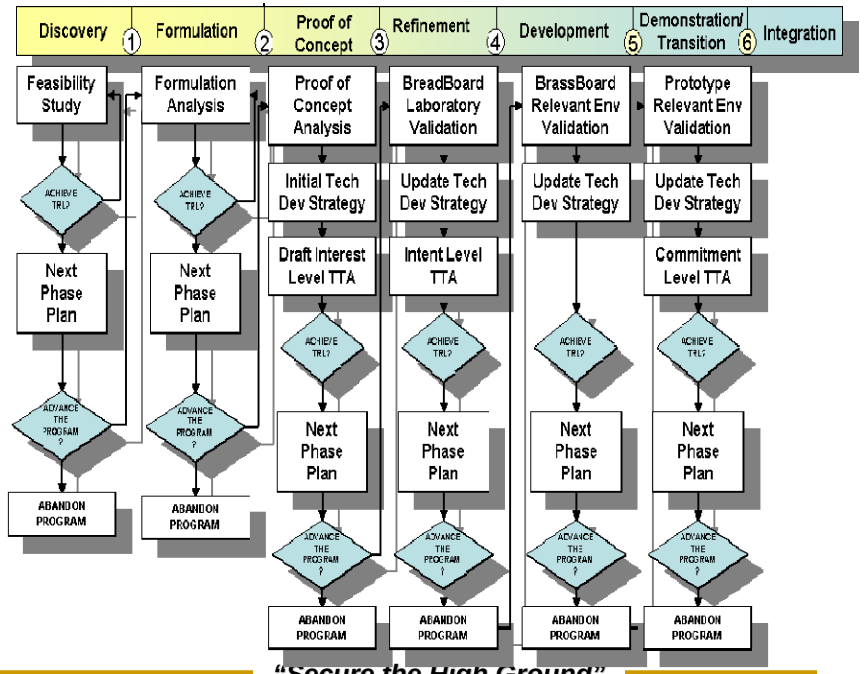


New Features:

- Tailorable and Flexible –
- Updated and aligned Exit Criteria and Deliverables
- Focused on Transition and Requirements
- Activity set developed in database in prep for automation
- Integrating Customer Requirements and other Readiness levels

Structural Differences:

- TRL phases have been redesigned
- Deliverables have been adapted and expanded to align to DoD 5000.2
- Systems Engineering Activities has been expanded with detailed fidelity and task breakdown
- Activities have been classified by category and threaded



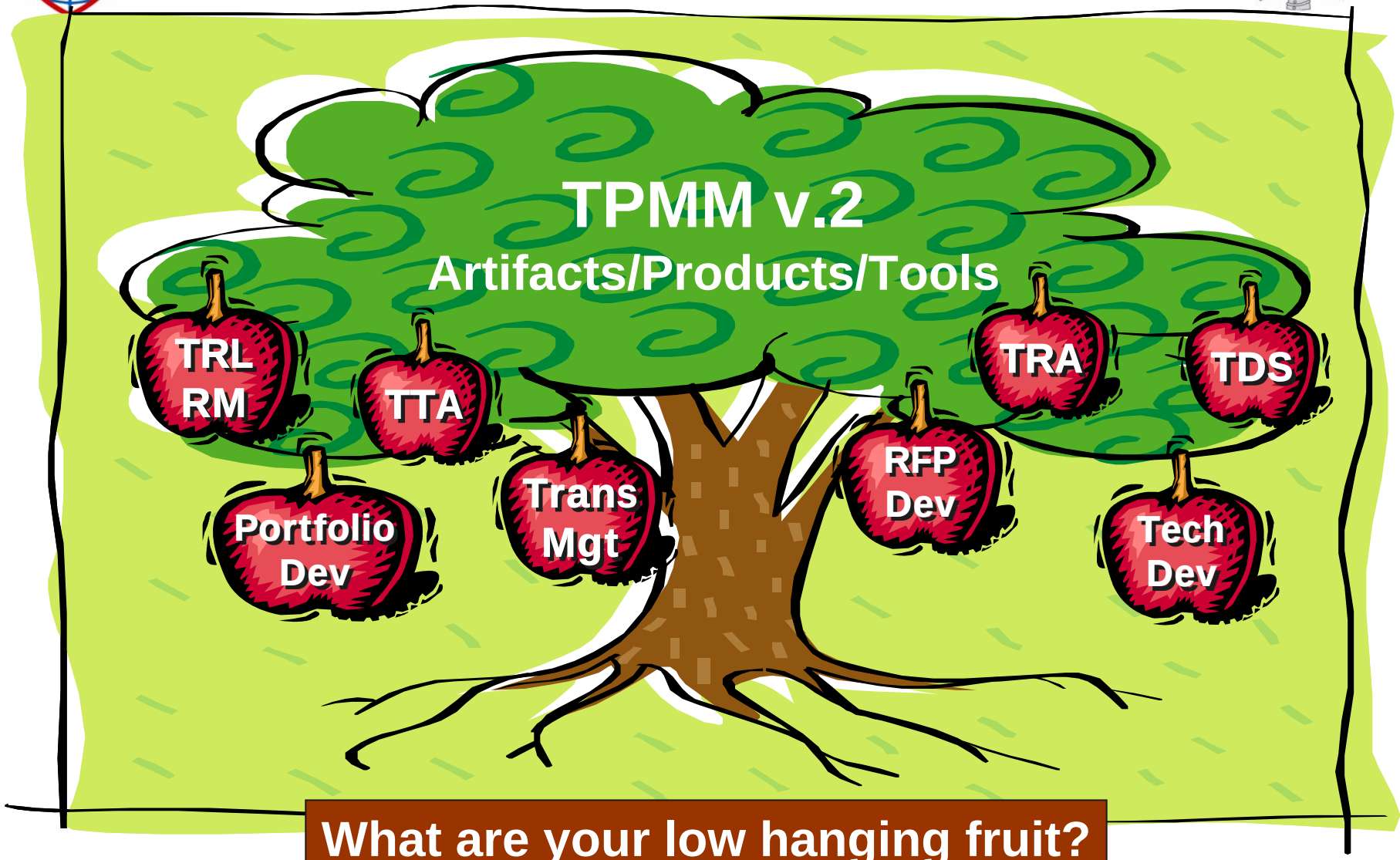
Technology Management Using TPMM v.2

TPMM v.2 provides *standardized*:

- Planning – Provides tailorable activity set for each phase
  - RFP Development
  - TRL Roadmap
- Management – Executing tailored criteria set –
  - Deliverables
  - Exit criteria
  - Mechanism – transition and DoD 5000 alignment (TTA & TDS)
- Assessment – Evaluating data from tailored metric set
  - Technology Readiness Assessment
  - Gap Analysis (Risk Assessment)
  - Technology Advancement Assessment
- Deliverables – final product
  - Deliverable correlation
  - Templates & Examples

TPMM v.2 is a common yard stick to plan and measure technology development and transition

TPMM-based Point Solutions



What are your low hanging fruit?

TPMM v.2 Adoption

Increases the probability of successfully fielding the right technology solution at the right time by:

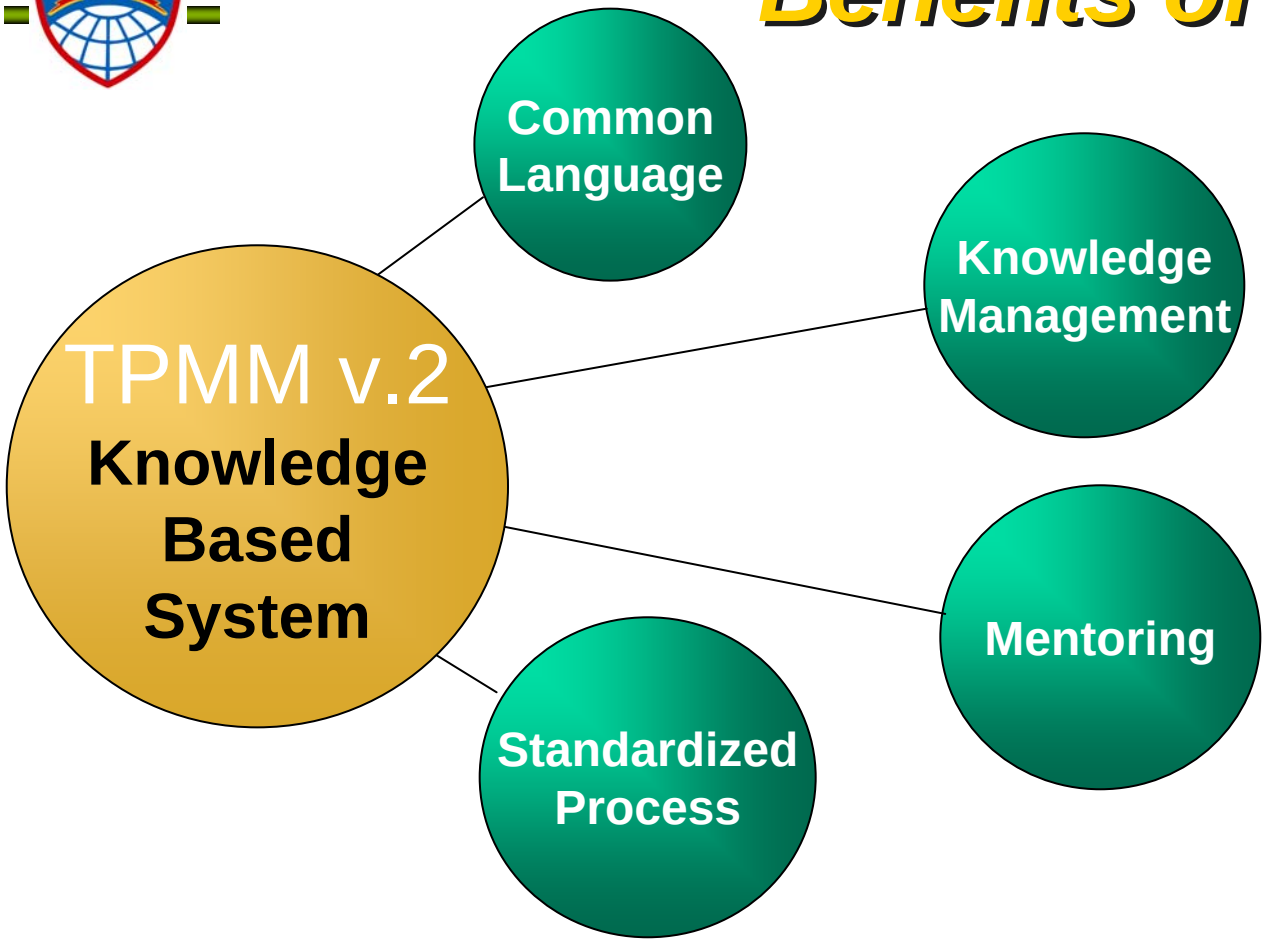
- Standardized process based on a validated development model
  - Pr… …matic, and tra…
  - Es…
  - Su… …ed across en…
  - Re…
- Standa…
- Provide…

S&T Shops Must Preserve Their Knowledge Base

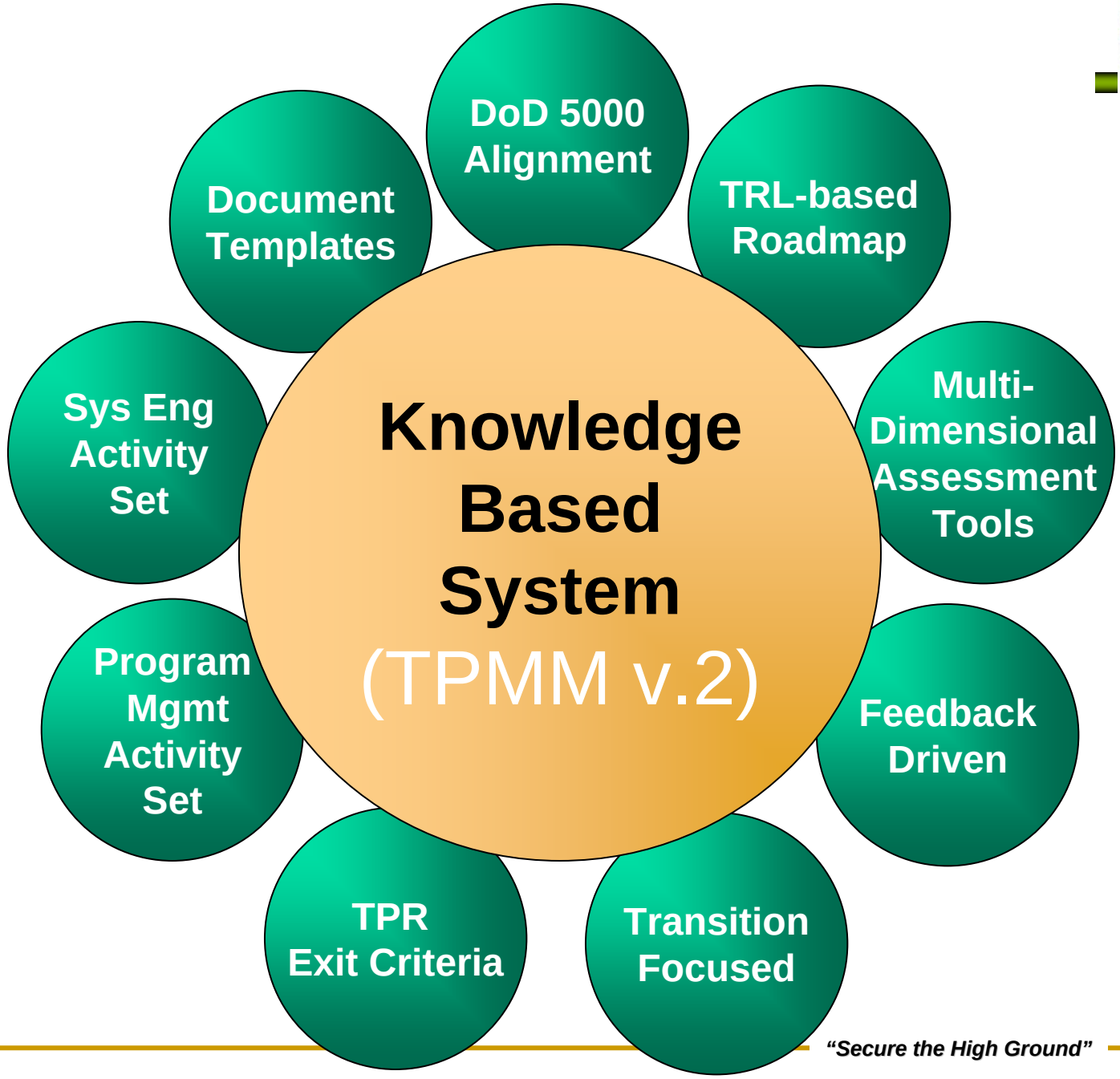
Increase… S&T Organiz… …n as:

- Fulfillment of the DoD 5000 technology development & assessment process
- Real-time enterprise-level TRL-based metrics for all S&T Programs
- Visibility into all aspects of the program portfolio execution
  - Program Justification (Auditing)
- Answer Maturity Trade-off requests
  - Tools for self-assessment of technology maturity for down selection

Benefits of a KBS



Provides a means to re-apply known solutions to current problems which can be used by others, less experienced in the problem area


DoD 5000 Alignment
TRL-based Roadmap
Multi-Dimensional Assessment Tools
Feedback Driven
Transition Focused
TPR Exit Criteria
Program Mgmt Activity Set
Sys Eng Activity Set
Document Templates
Knowledge Based System
(TPMM v.2)

TPMM/T3 Collaborator Base

- **Department of Homeland Security**
  - Exploratory Program Process
  - DHS customized TPMM application
- **Defense Threat Reduction Agency**
  - Web-based Tech Tran Agreement
  - DTRA customized TPMM application
- **MDA**
  - Kill Assessment Technologies (KA)
  - QS

- **SOCOM**
  - TPMM flow process
  - TTA/TDS Development
- **Defense Acquisition University**
  - Best Practice classes
  - Speaker at workshops
- **UAH**
  - Guest speaker at SE Short Course
- **NASA**
  - TRLs Definitions

TECHNICAL PROGRAM MANAGEMENT MODEL

- **Focused on providing a tailorable model for Technology Development.**
  - **TRL Assessment – Validated Exit Criteria**
  - **System Engineering Process - Aligned To TRLs**
  - **Programmatic Planning**
  - **MDA Criteria (HW/SW/EM) Readiness Assessments**
  - **Focused on Successful Transition**

- **Increases Probability of Customer Acceptance and Funding Support**

- **Improves Documentation Process to Support STO / ATD / ACTD Nomination Process or Transition to an Acquisition Program**

"TPMM: A Model for Technology Development and Transition"